IEC 62610-5

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

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Mechanical structures for electrical and electronic equipment – Thermal management for cabinets in accordance with IEC 60297 and IEC 60917 series – Part 5: Cooling performance evaluation for indoor cabinets

Structures mécaniques pour équipements électriques et électroniques – Gestion thermique pour les armoires conformes aux séries IEC 60297 et IEC 60917 – Partie 5: Évaluation des performances de refroidissement pour les baies intérieures

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MECHANICAL STRUCTURES FOR ELECTRICAL AND ELECTRONIC EQUIPMENT – THERMAL MANAGEMENT FOR CABINETS IN ACCORDANCE WITH IEC 60297 AND IEC 60917 SERIES –

Part 5: Cooling performance evaluation for indoor cabinets

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International Standard IEC 62610-5 has been prepared by subcommittee 48D: Mechanical structures for electrical and electronic equipment, of IEC technical committee 48:Electrical connectors and mechanical structures for electrical and electronic equipment.

The text of this standard is based on the following documents:

CDV	Report on voting
48D/591/CDV	48D/604/RVC

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

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This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

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Future standards in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated at the time of the next edition.

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INTRODUCTION

Indoor cabinets containing electronic equipment in subrack(s) and/ or chassis provide cooling by several different means, depending on the heat load of the equipment in the cabinet. In most cases air convection is used for cooling. The cabinets can be sealed or non-sealed, and may be equipped with fans for forced air cooling or rely on natural convention cooling without fans. In addition the subrack(s) or chassis may contain their own fans or rely on natural convention. Air convection systems are used to cool low to medium heat load applications. Indoor cabinets containing subrack(s) and/ or chassis assembled with high heat load electronic equipment typically are cooled by air to air heat exchangers or water supplied heat exchangers, and are not considered in this standard.

Sealed cabinets are used for systems operated in an industrial atmosphere, to protect the equipment against harsh environments, such as dust or water (IP), or provisions for EMC or acoustic noise. Non-sealed cabinets are used in offices, laboratories or data centres, where the environment is controlled.

The cooling performance of an electronic cabinet depends on the type of the cabinet, either sealed or non-sealed, with or without air moving devices, ventilated or re-circulated, and also, on the heat loads and the additional cooling systems (if any) of the equipment inside the cabinet.

Therefore, it is difficult to determine properly the cooling capabilities of empty electronic cabinets for various applications. This standard introduces a simplified method for an overall cooling performance evaluation for empty indoor cabinets in accordance with IEC 60917 or IEC 60297 series.

The purpose of this standard is to classify the cooling methods of empty indoor cabinets, to simplify the thermal hydraulic formulae for the evaluation and classification of cabinet cooling performances, and to exemplify the cooling performances for representative cabinet sizes based on IEC 60917 or IEC 60297.

This enables the users to select the appropriate cabinet cooling solutions for their applications.

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MECHANICAL STRUCTURES FOR ELECTRICAL AND ELECTRONIC EQUIPMENT – THERMAL MANAGEMENT FOR CABINETS IN ACCORDANCE WITH IEC 60297 AND IEC 60917 SERIES –

Part 5: Cooling performance evaluation for indoor cabinets

1 Scope

This part of IEC 62610 specifies a method for evaluating the cooling capacity mainly for air convection cooling of empty cabinets in accordance with IEC 60297 and IEC 60917 series.

2 Normative references

Void.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
ventilation
movement of the air inside a cabinet, causing replacement of the inside air by the cabinet external ambient air

3.2
buoyancy
force of air in the opposite direction of gravity that is produced by the difference in density due to the temperature differences between the air inside and external to the cabinet

3.3
natural ventilation
air movement produced by buoyancy

3.4
forced air cooling
forced ventilation
ventilation by air moving devices

3.5
natural convection cooling
cooling by natural air convection and radiation

3.6
air moving device
device creating air movement, e.g. fans, blowers, and other forced air movement equipment

3.7
sealed cabinet, without air moving devices
cabinet not provided with ventilation holes, not equipped with air moving devices, where the heat is transferred to the external environment by natural convection and radiation from the external surfaces of the cabinet

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